

WHAT IS CLAIMED IS:

1 Sub 1
2 1/2
3 1. A sealing system for a rotating machine having a
4 comprising:

5 a plate comprising a bearing surface, the plate
6 being connected to one of said drive element and said
7 stationary element; and

8 a sealing assembly comprising a resilient bellows
9 and a bearing surface, the bellows providing a force
10 which causes the bearing surface of the sealing assembly
11 to bear on the bearing surface of the plate to form a
12 dynamic seal.

1 2. The sealing system of claim 1, wherein the
2 sealing assembly further comprises a thrust plate
3 attached to the resilient bellows, and wherein the thrust
4 plate provides said bearing surface of the sealing
5 assembly.

1 3. The sealing system of claim 2, wherein the
2 resilient bellows comprises a collar to which the thrust
3 plate is attached.

Sub 1
2 1/2
3 4. The sealing system of claim 3, wherein the
sealing assembly further comprises a static sealing
element, the static sealing element being disposed within

4 a gap provided between the collar and the thrust plate.

1 5. The sealing system of claim 1, further
2 comprising a mounting element which connects said plate
3 to said one of said drive and stationary elements.

1 6. The sealing system of claim 1, wherein the
2 resilient bellows comprises at least one corrugation.

1 7. The sealing system of claim 1, wherein at least
2 one of said plate and said thrust plate comprises
3 graphite which provides a sealing and lubricating layer
4 to the dynamic seal.

1 8. The sealing system of claim 1, further including
2 a driven element operatively associated with said drive
3 element.

1 9. The sealing system of claim 8, wherein the
2 driven element comprises an impeller.

1 10. The sealing system of claim 8, wherein the
2 driven element comprises a propeller.

1 11. The sealing system of claim 8, wherein the
2 driven element comprises a mixing bar.

1 12. The sealing system of claim 1, further

2 comprising a seal chamber which at least partially
3 encloses said sealing assembly.

1 13. The sealing system of claim 12, wherein the
2 seal chamber is defined by the stationary element.

1 14. The sealing system of claim 12, further
2 comprising a seal gland which closes an area of the seal
3 chamber.

Sub
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1 15. A sealing system for a rotating machine having
2 a stationary element and a drive element rotationally
3 connected to said stationary element, the sealing system
4 comprising:

5 a drive plate comprising a bearing surface, the
6 first plate being rigidly connected to said drive
7 element;

8 a stationary plate comprising a bearing surface, the
9 second plate being rigidly connected to said stationary
10 element; and

11 a sealing assembly comprising a resilient bellows, a
12 first bearing surface and a second bearing surface, the
13 bellows providing a force which causes the first bearing
14 surface of the sealing assembly to bear on the bearing
15 surface of the drive plate forming a first dynamic seal
16 and causes the second bearing surface of the sealing
17 assembly to bear on the bearing surface of the stationary
18 plate forming a second dynamic seal.

A31 16. A sealing system for a rotating machine having
2 a stationary element and a drive element rotationally
3 connected to said stationary element, the sealing system
4 comprising:

5 a drive plate comprising graphite and a bearing
6 surface, the drive plate being rigidly connected to said
7 drive element

8 a stationary plate comprising graphite and a bearing
9 surface, the stationary plate being rigidly connected to
10 said stationary element;

11 a sealing assembly comprising a resilient corrugated
12 bellows providing a force and having first and second
13 collars, a first thrust plate attached to the first
14 collar and providing a first bearing surface, and a
15 second thrust plate attached to the second collar and
16 providing a second bearing surface;

17 a first static sealing element, the first static
18 sealing element being disposed within a first gap
19 provided between the first collar and the first thrust
20 plate;

21 a second static sealing element, the second static
22 sealing element being disposed within a second gap
23 provided between the second collar and the second thrust
24 plate;

25 a drive plate mounting element which connects the
26 drive plate to the drive element; and

27 a stationary plate mounting element which connects

the stationary plate to the stationary element;
wherein the first and second thrust plates further
comprise graphite, and wherein the force of the bellows
causes the first bearing surface of the sealing assembly
to bear on the bearing surface of the drive plate forming
a first dynamic seal comprising a first sealing and
lubricating graphite layer, and the force of the bellows
causes the second bearing surface of the sealing assembly
to bear on the bearing surface of the stationary plate
forming a second dynamic seal comprising a second sealing
and lubricating graphite layer.

α^{eff} , β^{eff} and γ^{eff} are defined as follows

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